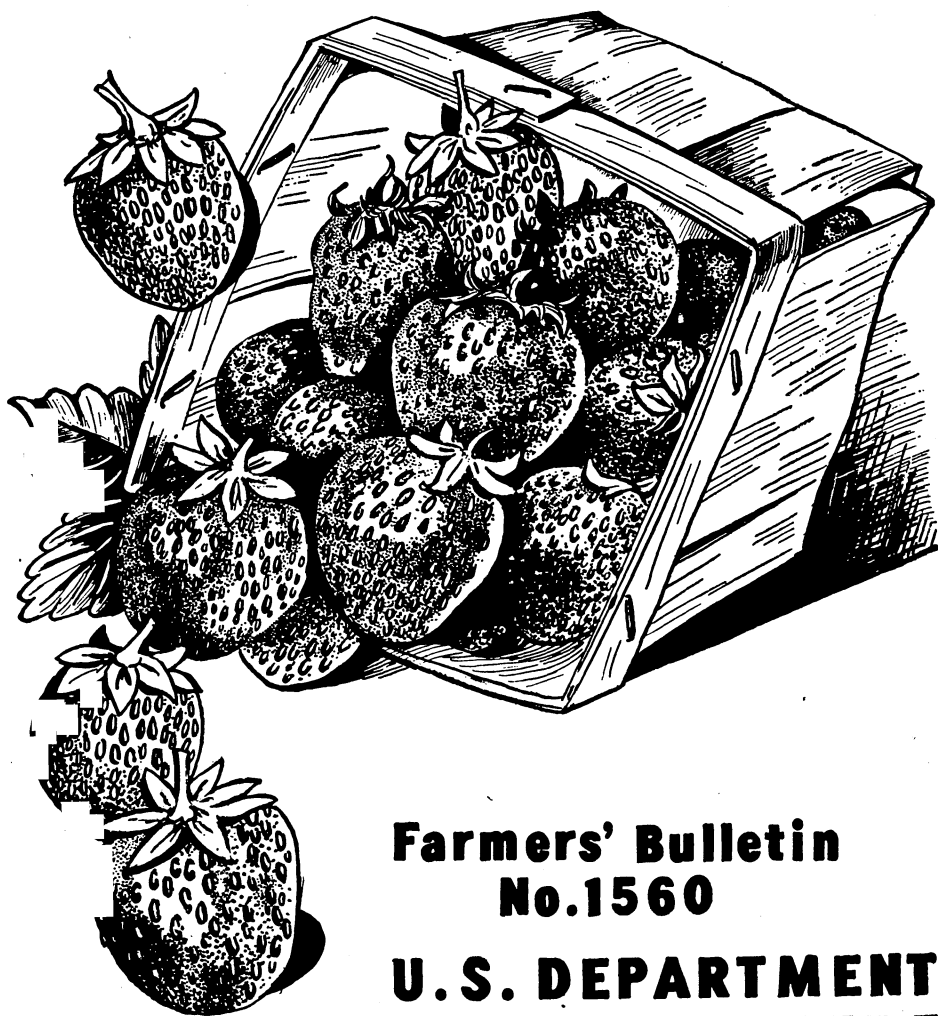


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Preparing Strawberries for Market



**Farmers' Bulletin
No. 1560**

**U. S. DEPARTMENT
OF AGRICULTURE**

STRAWBERRIES are one of the most perishable fruits and require particularly careful handling during harvesting, grading, packing, and shipping to avoid unsatisfactory delivery in consuming markets.

This bulletin describes methods of preparing strawberries for market which are considered practical and efficient in the various important commercial producing areas throughout the United States.

Standard grades are used extensively by growers in preparing their crop for market, by dealers in the purchase and sale of the fruit, and as a basis for inspection at both shipping point and terminal market.

The questionable condition and quality of some strawberries found on the markets indicate the need for more extensive use of standard grades and continued attention to improvement in handling methods.

This bulletin was first published in 1928 and was revised in 1936 and 1940.

PREPARING STRAWBERRIES FOR MARKET

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IMPORTANCE OF GOOD HANDLING

SUCCESS in marketing strawberries is dependent to a large extent upon the proper picking, grading, and packing of the fruit. Strawberries of a dependable grade and pack inspire in the trade a confidence which is reflected in greater demand and higher prices for the product. The best of marketing facilities cannot overcome the handicap of poor handling methods prior to shipment and good prices ordinarily are not obtained for an inferior product.

Dissatisfaction and lack of confidence by dealers and consumers are caused, in a large degree, by carelessness in preparing the fruit for market. Improvements in handling methods are accomplished through systematic efforts of growers and grower organizations, with the earnest cooperation of dealers.

LABOR SUPPLY

One of the most important factors in properly handling a strawberry crop is a sufficient labor supply. In most growing areas arrangements can be made to employ members of neighboring families or workers from nearby towns in sufficient numbers to harvest berries as fast as they ripen. Large numbers of children are commonly employed in harvesting strawberries and many growers furnish transportation for workers from nearest towns or cities. Local people are usually preferable to transient labor but in harvesting a large acreage, outside help frequently must be obtained. In many districts housing or camping facilities are furnished to transient families.

¹ The first edition of this bulletin was written by R. G. Hill, now deceased.

Acknowledgment is made of the assistance of field representatives of the Production and Marketing Administration and of the State marketing officials who supplied specific information relating to various producing areas for use in this revision.

In certain areas in Michigan many transient Negroes and Mexicans are employed and in some of the larger growing districts in Washington labor camps are maintained for Mexicans and Indians.

Such laborers generally require close supervision and may be inclined to move on to other locations after the height of the season is over. For this reason it is a practice in some districts to pay a premium or bonus, in addition to the regular picking price per box, to pickers who stay until the end of the harvesting season.

PICKING

Proper supervision of the picking force is especially important with the strawberry crop because of the ease with which the berries are damaged. The quality of the berries delivered to the packing shed depends, to a large extent, upon the efficiency of those in charge of the pickers. On small farms picking is usually supervised by the grower or some member of his family but where large numbers of pickers are necessary, hired field bosses or foremen are in charge of pickers. Such supervisors assign rows to pickers, check work to see that no ripe berries are left unpicked, that the number of green or otherwise defective berries placed in containers is held to a minimum, and that pickers do not trample the rows unnecessarily. In many localities pickers work between rows, picking one half of the row on either side. This practice prevents damage to plants and unpicked berries. Depending on the type of laborers employed and various other conditions, the number of pickers a foreman can supervise to advantage usually ranges from 20 to 50. The grower can advantageously spend most of his time in the general supervision of the picking, grading, and packing operations.

In most growing areas, fields are usually picked every other day, although when weather is such that berries are ripening rapidly, picking every day may be necessary. In the larger growing areas of Washington and Oregon, where practically all berries are grown for freezing, fields are picked every third to fourth day. In any location, weather naturally slows down or speeds up the frequency of picking and the proper stage of ripeness for picking depends upon the variety, distance to be shipped, and whether berries are intended for marketing fresh or for processing.

Some varieties are naturally firm, and can safely be allowed to attain full red color; others soften quickly when ripe, and must be picked before they reach full red color. Varieties that soften quickly are not suitable for long-distance shipment. Berries for processing or for local markets can, of course, be allowed to ripen more fully than those intended for distant markets. In warm weather, picking should be done in the coolest part of the day, if possible.

Most of the shippers of the Southern States, from which most of the berries are transported long distances, prefer to ship berries that are about three-fourths colored to a full red color. Naturally not all berries can be picked at the same stage of ripeness. Variations from the most desirable conditions depend largely upon the experience and efficiency of pickers and the degree of field supervision. Proper supervision reduces the variations in color and firmness to a minimum and provides a more uniform product.

Strawberries must be picked when firm enough to be transported and distributed to consumers successfully, but it is practically always true that, other factors being equal, well-colored berries sell faster and at better prices than those showing poor color.

Berries for marketing in the fresh state should be picked by pinching off the stem of each individual berry between the thumb and forefinger. A portion of stem about three-eighths to one-half inch in length should be left on each berry (fig. 1).



PMA 18700

FIGURE 1.—Proper method (left) and two improper methods (right) of picking strawberries for marketing as fresh berries.

Berries should be carefully placed in boxes. To gain speed, there is always a tendency for pickers to pull or snatch the berries from the plant and toss or drop them into the boxes, or to bruise berries by holding too many in the hand at one time. Pickers frequently cause much unnecessary handling and consequent bruising of berries by overfilling boxes or field carriers with fruit which must be transferred to other boxes. Bruised berries and berries without caps and stems do not carry well to market. Unless each row is picked clean of all berries that are ready, the next picking will contain overripe fruit which is susceptible to rapid deterioration.

When berries are picked for freezing or other processing they are generally picked without caps or stems and can usually be allowed to reach a somewhat more advanced degree of maturity than those intended for the fresh market.

Various methods of giving pickers credit for their work are commonly used. Under one method large tickets are carried by the pickers and punched by the supervisor to show the number of boxes picked. Another method utilizes small tickets or tokens bearing numbers conforming to the number of filled boxes. These tickets or tokens are given to the pickers as filled trays or carriers are delivered. In some districts pickers are paid in cash as each full carrier is brought to the packing shed. By still another method, a record is made, in view of the picker, of the number of filled boxes.

In most districts hand carriers or trays are used by pickers for carrying boxes in the field (fig. 2). These vary in size for different localities. The most popular carriers hold 4 or 6 quart boxes or 6 or 8 pint boxes. Carriers should be substantially built but light in weight and so constructed that boxes fit in them snugly. They should be delivered to the packing shed as soon as filled to avoid exposure of the fruit to the sun. Sun, rain, or dust are injurious to picked berries whether in the field or during subsequent handling. Some growers furnish laborers to collect berries from the pickers in the field as fast as carriers are filled.



EXT. S-13177

FIGURE 2.—Picking scene showing one type of field carrier used in picking strawberries. Note in the background the packing shed, and the busses for transporting pickers to and from the fields.

GRADING

Strawberries for fresh shipment should be graded either while they are being picked or by hand-sorting the individual berries after they are picked. Which of these methods will prove most satisfactory will depend upon various factors such as growing practices, weather conditions, and care in picking. Any extra handling detracts from the keeping quality of the berries, but in many districts hand grading in the packing shed is both necessary and profitable. Hand sorting or grading consists of separating undesirable or cull berries from the better fruit.

Grading in the field by pickers requires the least handling but can only be entirely successful when strictly supervised or done by exceptionally conscientious, reliable employees.

In many of the more important growing districts, grading is done entirely at packing sheds where the berries are removed from the boxes used in picking, and are sorted before being returned to the same boxes or transferred to other boxes. A method frequently utilized is "pan grading." Each box of field-run berries is emptied into a specially constructed tin grading pan (fig. 3). The fruit is then slowly poured back into the box and during this process berries which do not meet the desired grade are removed. When carefully done this is an excellent grading method.



PMA 18696

FIGURE 3.—Tin grading pan used in some areas for sorting and inspecting strawberries.

In Louisiana, Florida, North Carolina, Arkansas, Missouri, Tennessee, Kentucky, and Indiana, berries are usually hand graded at the packing shed. In Alabama, Michigan, Illinois, Virginia, Maryland, and California most berries are graded by pickers only, the filled boxes usually being inspected and classified by the grower or other supervisor.

Whether or not berries are hand graded, they should be classified at the packing shed. Filled boxes should be placed in separate crates according to quality and size of the berries in order to eliminate any wide variations in value between boxes in any one crate. Classification should be based on well-defined standards, and the crates should be marked and segregated to avoid undesirable variation within lots.

STANDARDIZED GRADES

Standardized grades, properly and consistently used, promote honesty and fair dealing, and discourage careless and unscrupulous packers. They enable the conscientious grower and shipper to realize a premium for care, honesty, and good judgment. They provide a common language with which to describe quality, maturity, size, condition, and any other factors that determine the value of a given shipment. They serve as a convenient, fair, and understandable basis for inspection at shipping points and in receiving markets, for price quotations, for sales, for adjustments of claims, for cooperative pool-

ing, for financing, and for the reporting and intelligent comparison of market prices.

The United States Department of Agriculture has issued grades for strawberries which have attained extensive use. "U. S. Standards for Strawberries" are used for berries which reach the consumer in the fresh state. "U. S. Standards for Growers' Stock Strawberries for Manufacture" and "U. S. Standards for Washed and Sorted Strawberries for Freezing" are used for berries to be processed. The requirements of a grade provided in any one of these standards have the same interpretation wherever such grade may be used throughout the United States.

One of the first requisites for a good grade of berries intended for fresh marketing is that they must be firm enough to carry to market. Overripe berries usually become soft, moldy, or decayed by the time they reach the consumer. Immature and green berries also seriously affect appearance and general quality.

The size of fresh strawberries is also basically important. Size varies with the variety, weather, and the section in which the berries are produced. Usually the trade prefers berries not less than three-fourths inch in diameter. A reasonable variation in size within boxes is expected, yet careful attention is needed to prevent packing boxes of generally small berries in crates that contain boxes of mostly large berries.

Obviously, berries damaged by bruising, crushing, cuts, dirt, or sand should be discarded as well as those which have lost the caps. In one Florida district the berries are washed to remove dirt and sand. Cold water is an aid in cooling the fruit but water must be changed constantly to avoid the spread of decay organisms.

Varieties of berries should not be mixed in boxes or crates as this practice results in variable appearance and differences in carrying quality.

Every producing section needs uniform grades, and it is believed that the grades issued by the Department meet these needs. The value of standard grades depends upon their specifications and the extent to which growers, shippers, and dealers use them.

PACKING

When properly filled, strawberry boxes should be neither slack nor so full that berries are likely to be crushed by covers or separators; they should be full enough to look attractive and to maintain a well-filled appearance until reaching the consumer. Most growers fill boxes well but a few endeavor to increase their own profits by slack packing. Slack-packed berries are difficult to sell, and the grower who puts out a slack pack will eventually be the loser. Boxes in the lower layers of any crate should be as well filled as those in the top layer.

In Louisiana, Florida, and North Carolina, boxes are generally face packed, which consists of placing berries in the top layer on their sides, all pointed one way, or placing each berry in the top layer with the stem down. In Alabama approximately half of the shipments are face packed. "Facing" makes an attractive package and, provided the extra labor cost is warranted by the selling price, may be desirable if

the berries on the face of the box are reasonably representative of the contents of the box. Placing the best berries in the top layer and poorer or smaller berries in the bottom of the box misrepresents the contents and can only result in dissatisfaction to dealers and consumers. Some States have enacted laws to prevent "facing" boxes with berries not representative of the remainder of the contents.

PACKING SHEDS

Careful supervision at the packing shed by the grower, a member of his family, or a reliable employee, is of primary importance if a satisfactory grade and pack are to be produced. Good supervision not only provides a uniform grade and pack but also serves as a check on the competence of those in charge of the picking operation.

Work at the packing shed includes receipting for the berries delivered by the pickers, grading or classifying, packing, placing boxes in the crates, marking, and closing crates. When the acreage is small, all of this work may be performed by the grower or members of his family; but when the acreage is large, specialized employees must be assigned to the various operations.

The location of the packing shed should reduce to a minimum the walking necessary for the pickers in delivering their berries and should also eliminate, as far as possible, the temptation for pickers to walk across the rows to reach the shed. A location providing access to trucks or other transportation is, of course, a prime consideration.

Packing-shed facilities vary from the shade of a tree to a porch, a tent, a temporary shed, or a permanent-type shed. The most common type is a cheaply constructed, board-roofed shed with or without boarded sides. The cheaply constructed temporary type of shed predominates because of frequent relocations of plantings and the short season during which most sheds are utilized. Where the same facilities can be conveniently used for other products a permanent packing shed may be advisable.

A convenient plan for a packing shed is shown in figure 4. Pickers are required to enter one end of the passageway at the front of the shed. A supervisor receipts for the boxes of berries delivered by the pickers at the entrance of this passageway. The pickers place filled boxes on the receiving table and obtain a supply of empty boxes at the other end of the passageway. The back part of the receiving table is used for grading and packing. Benches, upon which empty crates are placed to be filled, are at a convenient distance from the packing table. Back of the packing table there is a solidly built bench upon which the filled crates are placed for nailing or for other methods of closing. Plenty of space is needed to stack the filled crates so that they will not be exposed to the sun, and to keep a supply of empty crates. In permanent-type sheds, storage space for empty crates is usually provided in the second story. There should be a free circulation of air in the packing shed for the comfort of the packers and for the ventilation of filled crates.

CONTAINERS

The small containers in which strawberries are marketed are known as boxes, baskets, cups, or tills. In this bulletin they are called boxes.

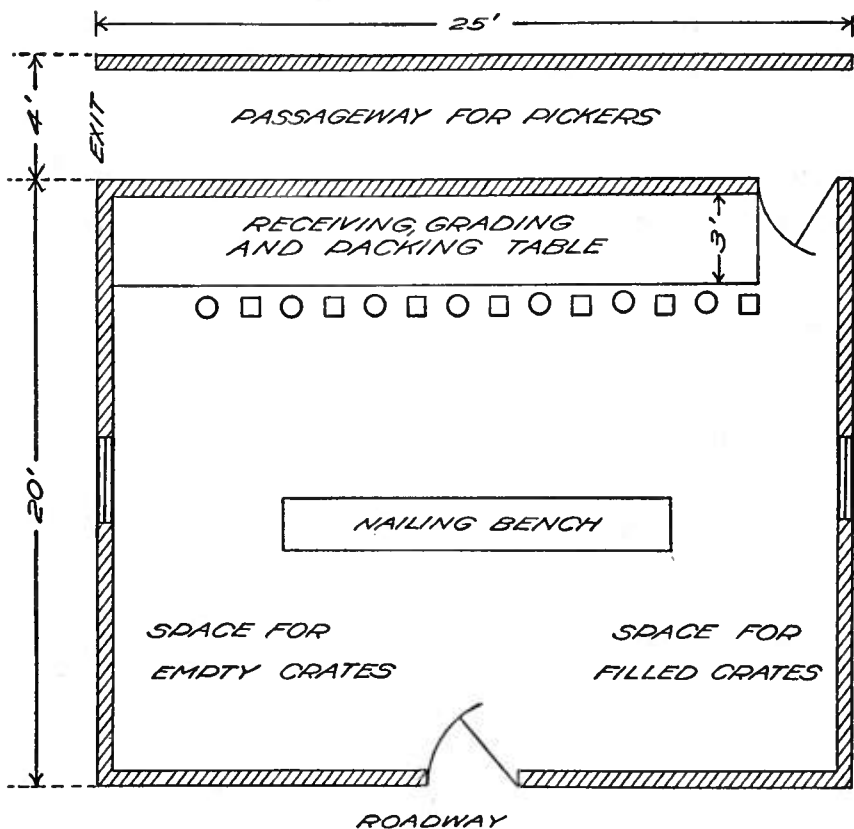


FIGURE 4.—A convenient packing shed plan.

PMA 1467

Through the United States Standard Container Act of 1916, three legal sizes for interstate shipment have been established for these boxes. The legal sizes are the quart, pint, and one-half pint based on dry measure. There are no fixed standard dimensions. Pint or quart sizes are usually used for strawberries and are made in several types (fig. 5).



PMA 18695

FIGURE 5.—Types of small containers most commonly used for strawberries for fresh shipment. From left to right, American, metal rim, oblong, Hallock, and paper boxes. All except the oblong type are used in both quart and pint sizes.

The American type, of wood veneer with slanting sides and bound at the top with wooden bands, is used extensively throughout the

South, East, and Middle West. Metal-rim boxes differ from the American type in that they are bound at the top with metal strips. They are used in various areas throughout the country. Oblong wood-rim boxes of 1-pint capacity are used almost exclusively in Florida. Hallocks also of wood veneer, but with vertical sides, are used to some extent in a few producing sections. Paper boxes, usually made in the same shapes as the American and metal-rim types, are most frequently used in some Pacific coast districts.



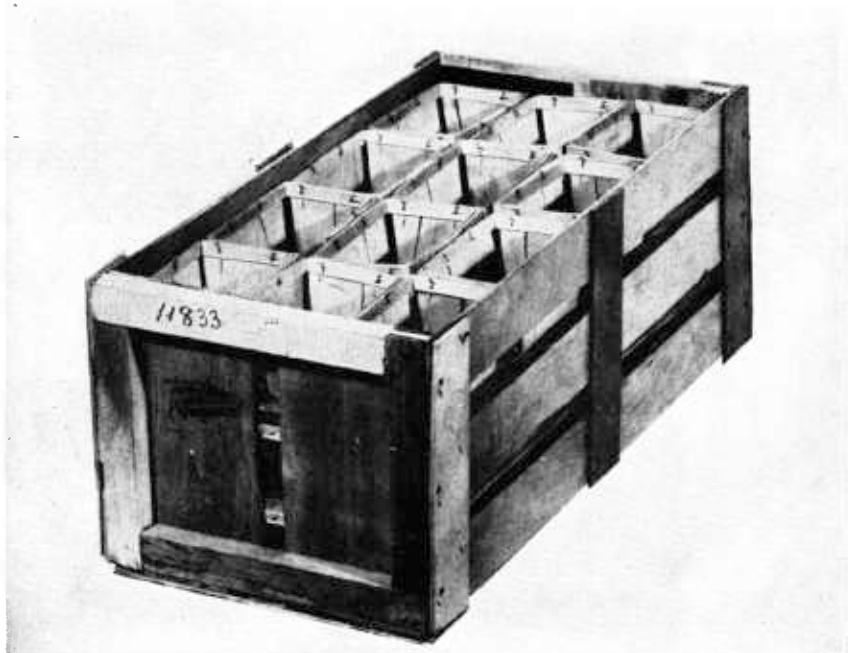
PMA 17938

FIGURE 6.—A 24-pint display crate, used in Louisiana.

Special crates have been developed to hold different types and sizes of boxes. Louisiana uses the 24-pint wirebound display crates with American-type boxes (fig. 6). The oblong pint boxes used in Florida are customarily packed in a 36-pint nailed crate (fig. 7). Twenty-four quart ventilated crates, of various types, are generally used in Alabama, North Carolina, Tennessee, Kentucky, Indiana, Illinois, Virginia, Maryland, Arkansas, and Missouri.

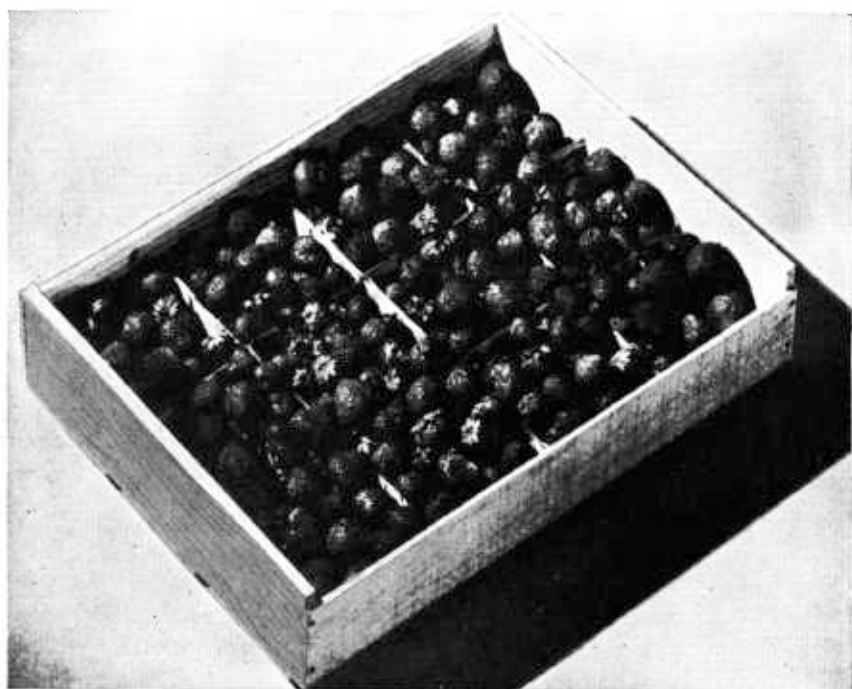
Michigan uses both 16-quart and 24-quart crates and Pacific coast districts usually use nailed crates holding 12 or 24 pints (fig. 8).

Whatever the box and crate type used, growers should endeavor to pack their product in clean, neat containers so constructed as to minimize damage in transit to market. The appearance of the container may increase or decrease the value of the product materially.



PMA 18248

FIGURE 7.—A 36-pint oblong berry crate, used in Florida.



PMA 17904

FIGURE 8.—A 12-pint flat berry crate, used in California.

BRANDING AND MARKING

Many strawberry-shipping associations and individuals use brand labels on crates, particularly for the better grades, although in many districts crates are not labeled. Most States require that the grower's name and address be stamped on crates. Variety and grade designations are also required in some localities.

Proper stamping and labeling are generally considered good practice in building a reputation for a desirable product.

INSPECTION

Most shippers in the principal producing districts have their strawberries inspected at shipping point by Federal-State inspectors (fig. 9). The shipping point inspection service is operated under a co-



FIGURE 9.—A Federal-State inspector inspects a grower's lot of strawberries at shipping point.

operative arrangement between Federal and State authorities. The product is classified in accordance with U. S. Standards. Certificates describing the quality, condition, grade, pack, and any other important factors relating to the various lots of fruit for which inspection is requested or required are issued by inspectors (fig. 10). Such certificates are receivable as prima facie evidence in any United States Court, and are generally accepted as a basis for buying and selling, and in settlement of allowances, rejections, or claims. The cost of

ORIGINAL

Form FV-47 (Louisiana) (1-13-50) Superseding FDA-10	UNITED STATES DEPARTMENT OF AGRICULTURE PRODUCTION AND MARKETING ADMINISTRATION LOUISIANA DEPARTMENT OF AGRICULTURE AND IMMIGRATION MARKET INSPECTION
	No. 58087
INSPECTION CERTIFICATE	
This certificate is issued in compliance with the regulations of the Secretary of Agriculture governing the inspection of various products pursuant to the act making appropriations for the United States Department of Agriculture and the Statutes of the State of Louisiana, and is admissible as prima facie evidence in all courts of the United States and Louisiana. This certificate does not excuse failure to comply with any of the regulatory laws enforced by the United States Department of Agriculture or the Federal Food and Drug Administration.	
Inspection point <u>Albany, La.</u>	Kind of car <u>Express Refrigerator</u> Car initial and number <u>R X I 6 0 0 2</u>
Inspection begun <u>2:00 P.M. April 17, 1950</u> Completed <u>4:30 P.M. April 17, 1950</u> <small>(HOUR, DATE) (HOUR, DATE)</small>	
Applicant <u>District Sales Agency</u> Address <u>Albany, La.</u>	
Shipper <u>Same</u> Address <u>Same</u>	
I, the undersigned, on the date above specified made personal inspection of samples of the lot of products herein described, and do hereby certify that the quality and/or conditions, at the said time and on said date, pertaining to such products, as shown by said sample, were as stated below:	
Condition of car: <u>Hatch covers closed, plugs in, bunkers full of ice.</u>	
Products: <u>STRAWBERRIES in 24-pint ventilated crates labeled "Star Brand."</u> <u>Loader's count 652 crates.</u>	
Loading: <u>Divided load, 8 rows, spaced between rows, 4 layers. Each layer stripped, top strips nailed. Centerbraced, with 12 crates on floor between bracing gates.</u>	
Pack: <u>Cups fairly well to well, mostly well filled; faced.</u>	
Size: <u>Generally medium to large, mostly medium. Average 2% under 3/4 inch in diameter.</u>	
Quality and condition: <u>Berries generally ripe, firm, clean and fairly well to well, mostly well colored. Grade defects average within tolerance. Less than 1 % decay.</u>	
Grade: <u>U. S. No. 1</u>	
Fee <u>\$6.52</u> Expenses _____ Total _____	<u>John Doe</u> INSPECTOR

PLEASE REFER TO THIS CERTIFICATE BY NUMBER ☆ U. S. GOVERNMENT PRINTING OFFICE 1950 - 872598

PMA 18697

FIGURE 10.—A Federal-State inspection certificate.



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FIGURE 11.—Loading a refrigerated truck in Florida.

such inspection is only enough to cover the expense involved. Inspectors are not financially interested in the product and are licensed by the United States Department of Agriculture.

In some producing areas berries are inspected by association inspectors as a means of maintaining a dependable, standardized product. In a few districts, growers and shippers do not use any type of official inspection.

Consistent, impartial, and thorough inspection serves to eliminate misunderstandings, deception, and dishonest packing; it also encourages the production of high-quality fruit, and reduces loss and waste by preventing shipment of inferior fruit.

SHIPMENT

In many localities, practically all strawberries are shipped by motortruck. Refrigerated trucks are used for shipments to distant markets (fig. 11). Strawberries may be collected at some central location at shipping point and moved direct to the receiver's place of business. Because of this direct movement, shipment by truck is generally faster than rail shipment, and excessive handling is usually eliminated. Truck shipments also facilitate less-than-carlot shipments to various markets along any given route and to many smaller markets difficult to reach by carlot shipment.

Because of many differences in types and sizes of trucks, loading methods vary greatly. Drivers or other employees of the truck

owners generally load the shipments in accordance with methods which experience has proved most practical, and are held responsible for safe delivery.

In several shipping areas large percentages of the berries are moved to markets in carlots. Cars are precooled and refrigerated, and salt is added to the bunker ice to maintain low temperatures. Carbon dioxide or dry ice to increase refrigeration and inhibit decay has been used for long distance shipments by some shippers in several districts and is generally used in express car shipments from the Santa Clara Valley in California. Usually about 1,000 pounds of dry ice is placed on the top spreaders of the bracing, the paper wrappers being left on the cakes of dry ice. About 100 pounds of dry ice is placed in the bunkers on top of the regular ice to give a quick buildup of carbon dioxide.

In carload lots the prime objectives are to prevent crates from shifting in transit and at the same time to allow for essential circulation of cold air to all parts of the load. Crates are loaded in rows across the car with the long side parallel to the side of the car, sufficient space being left between the rows to insure free air circulation. Each layer in the stack must be stripped crosswise of the car to prevent crates from shifting toward either side. All loads are center-braced. Proper loading and bracing of carlots are particularly important and require the most careful attention.

Standard loads for different districts vary according to container types. Florida's 36-pint crates are usually loaded 420 per car with 7 rows, 3 layers, each layer single stripped and nailed. The 24-pint crates used in Louisiana are loaded 8 rows, 4 layers, each layer double stripped, and the top strips nailed. The standard express refrigerator load is 736 crates.

In Arkansas and Missouri the standard refrigerator carload is 420 24-quart crates, loaded 7 rows, 3 and 4 layers, each layer double stripped and the top strips nailed. In Tennessee, Kentucky, and Indiana the loading is the same except that all strips are usually nailed.

Shipments of strawberries by air is largely in experimental stages in most districts, although cargo planes carrying the equivalent of a carload are being used to a considerable extent by some Louisiana shippers. Small weekly shipments, timed to arrive in northern markets for week-end sales, are made from the Plant City area in Florida.

Whatever the shipping method used, delay in loading and shipping should always be avoided. Any delay at shipping point will result in reducing the carrying quality of the fruit, and is particularly detrimental if the berries are not refrigerated.

METHODS OF SELLING

Varying sales methods have been developed in the different producing areas. Louisiana, Florida, and North Carolina strawberries are generally sold at shipping point auction, sales being based on U. S. grades.

In most shipping areas, sales are made by shipping association managers, sales agents, brokers, or direct by growers to on-the-spot buyers, and are generally based on U. S. grades. When U. S. grades are not used, it is usually necessary for buyers to rely on their own judgment as to the quality of the product.

STRAWBERRIES FOR FREEZING OR OTHER PROCESSING

In some growing districts a very large percentage of the production is sold for processing, which consists principally of freezing. Large areas in western Washington and Oregon are devoted entirely to production for freezing. It has been estimated that approximately 90 percent of all berries grown in these States are sold to freezing plants. In other areas varying percentages are utilized by processors, the quantity depending largely on prices that may be obtained for fresh market shipment, as compared with prices available for berries for processing. In most strawberry-growing districts there is an increasing demand for fruit for freezing.

As previously stated, berries for processing are generally picked without caps or stems, and may be more advanced in maturity than those destined for distant shipment. Processors in some districts use berries that have been discarded from the fresh packs because of defects. Stems and caps are removed from such berries prior to delivery to processing plants.

Berries for processing are usually purchased on the basis of the U. S. grades or on the basis of processors' special requirements and are inspected at the time of delivery to the processing plants.

PRINCIPAL PRODUCING STATES, VARIETIES, AND USE ²

Strawberries are grown to some extent in every State in the Union, but are of particular commercial importance in certain areas of Louisiana, Arkansas, Michigan, Florida, Kentucky, Indiana, Missouri, North Carolina, Tennessee, Alabama, Virginia, Maryland, Illinois, California, Oregon, and Washington.

Most Louisiana berries are packed for fresh use but large quantities are sold for freezing. Varieties grown are chiefly Klommore, a Klondike-Blakemore cross which is resistant to "Leaf Spot," and Klondike which is known for good red color and firm flesh.

Florida's production is practically all of the Missionary variety which requires a minimum dormant season and produces firm fruit with good carrying quality for distant shipment. The crop is grown primarily for fresh shipment but berries found unsuitable for fresh packing are sold for processing.

Alabama's heaviest production is of the Blakemore variety, which is favored because of its hardy growing and fruiting qualities and the firmness of the berries. Missionary and Klommore are also grown and there is a present upward trend in plantings of Missionary because of its high yields for processing purposes. Somewhat more than half of the Alabama crop is usually sold for freezing; the remainder is shipped for fresh use.

Premier, Robinson, and Dunlap are the leading varieties in Michigan's crop, although several others are grown in considerable quantities. Premier leads the commercial varieties because of unusual frost resistance combined with earliness and high productive capacity. It is estimated that more than 90 percent of the Michigan production is usually sold for fresh use.

²For more detailed information regarding varieties see Farmers' Bulletin No. 1043, Strawberry Varieties in the United States.

Tennessee's chief variety is Blakemore. Other varieties produced in some volume are Tennessee Shipper and Tennessee Beauty. Somewhat more than one-half of the crop was sold for processing in 1949.

In Arkansas 95 percent of the strawberries are of the Blakemore variety; Klonmore, Dunlap, and a few others are grown in small volume. A very large proportion of the crop is usually packed for fresh shipment.

Aroma is the principal variety grown in Missouri. Aroma is late maturing with very firm, large berries. Blakemore, Tennessee Beauty, and a few other varieties are grown in some volume. Practically all of Missouri's production is sold for fresh shipment.

Berries produced in Illinois are practically all marketed for fresh use and are mostly of the Blakemore variety, although Premier and others are grown to some extent.

North Carolina's crop is principally of two varieties, Massey and Klondike. Both produce fruit of good shipping quality. Massey follows Klondike in ripening, thus serving to extend the harvesting season. A considerable quantity of the Blakemore variety is also produced. Berries are mostly packed for fresh shipment, but an approximate average of from 10 to 20 percent of the yearly production is usually sold for freezing.

Blakemore is the leading variety in the Virginia-Maryland Eastern Shore growing area. Temple is an important variety and is grown almost exclusively in the Pittsville-Willards area where red-stele root disease is severe. Numerous other varieties, including Fairfax, Dorsett, Chesapeake, Midland, and Big Joe, are produced in some volume. In recent seasons a high percentage of the crop has been marketed for fresh use.